

CLAIMS

What is claimed is:

1. A method for establishing a radio frequency (RF) communications link between an RF ground-based transceiver and a mobile platform carrying an RF transceiver, via a satellite-based transponder, wherein said mobile platform is traveling within a predetermined coverage region, the method comprising the steps of:

a) using a control center to maintain a list of registered mobile platforms, wherein said registered mobile platforms are preauthorized to make use of said satellite-based transponder to transmit and receive data content to and from said ground-based transceiver; and

b) using said control center to cause said ground-based transceiver to transmit a plurality of polling messages substantially simultaneously, said polling messages radiating across said coverage region, and wherein each said polling message carries information addressed to a specific one of said registered mobile platforms and includes a preliminary, dedicated return channel which its intended said mobile platform is to use for communicating with said ground based transceiver.

2. The method of claim 1, wherein said preliminary, dedicated return channel has a minimum predetermined bandwidth.

3. The method of claim 1, further comprising the step of causing said control center to cause each said polling message to timeout if its associated said mobile platform does not transmit a response with a predetermined time on its said preliminary, dedicated return channel.

4. The method of claim 3, wherein said control center causes each of said polling messages whose respective mobile platforms do not respond within said predetermined time on their said preliminary, dedicated return channels to timeout simultaneously.

5. The method of claim 1, wherein each said preliminary, dedicated return channel comprises a predetermined bandwidth; and

wherein said central controller maintains a database of said return channels in use at all times.

6. The method of claim 5, wherein said central controller removes any one of said mobile platforms from said polling database upon receiving a response therefrom on said mobile platform's said preliminary, dedicated return channel.

7. The method of claim 1, wherein each said polling message includes a message body comprising:

an aircraft identification code;

information concerning which one of a plurality of satellites said aircraft

a frequency of a specific transponder for establishing a return

a multiple access code.

8. The method in claim 5, wherein said central controller adjusts a

size of a batch of said polling messages in a subsequent polling sequence in

accordance with available resources of said satellite-based transponder and said

RF ground-based transceiver.

9. A method for establishing radio frequency (RF) communications links between at least one RF base station transceiver and a plurality of mobile platforms carrying RF transceivers, via at least one satellite-based transponder, wherein said mobile platforms are traveling within a predetermined coverage region, the method comprising the steps of:

a) using an operations center to maintain a list of registered mobile platforms, wherein said registered mobile platforms are preauthorized to make use of said satellite-based transponder to transmit and receive data content to and from said RF base station transceiver; and

b) using said operations center to cause said RF base station transceiver to transmit a plurality of polling messages simultaneously to all of said registered mobile platforms which are not then communicating with said base station, each said polling message being addressed to a specific one of said mobile platforms and designating a dedicated return channel for its associated mobile platform to respond on;

c) waiting a predetermined period of time for a response from each of said registered mobile platforms not then communicating with said RF base station; and

d) causing those said polling messages for which a response is not received on their designated return channels within said predetermined period of time to timeout substantially simultaneously.

10. The method of claim 9, further comprising the step of causing said operations center to maintain a database of said return channels in use at all times.

11. The method of claim 9, further comprising the step of causing said operations center to maintain a database of all said return channels which are not in use at any given time.

12. The method of claim 9, further comprising the steps of:

causing said mobile platform to determine its location within said coverage region prior to responding to its associated said polling message;

causing said mobile platform to determine the location of said satellite-based transponder;

causing said mobile platform to point an antenna thereof in a direction of said satellite-based transponder;

causing a transceiver carried by said mobile platform to tune to a previously determined frequency on which said polling messages are being transmitted by said satellite-based transponder; and

causing said transceiver to generate a response signal on said dedicated return channel.

13. The method of claim 12, further comprising the steps of:

using said control center to define a predetermined bandwidth on said dedicated response channel;

once said mobile platform establishes a communications link with said base station via said satellite-based transponder, causing said mobile platform to request additional bandwidth;

causing said operations center to determine if said requested additional bandwidth is presently available; and

if said additional bandwidth is presently available, using said operations center to cause said base station to transmit an authorization to said mobile platform to use a larger bandwidth response channel for subsequent communications with said base station.

14. A method for establishing a plurality of radio frequency (RF) communications links between an RF base station transceiver and a plurality of mobile platforms each carrying an RF transceiver, via satellite-based transponder, wherein said mobile platforms are all traveling within a predetermined coverage region, the method comprising the steps of:

a) causing each said mobile platform to tune an RF transceiver thereof to a known, predetermined frequency at which polling messages are being transmitted by said satellite-based transponder;

b) using an operations center to maintain a list of mobile platforms authorized to communicate with said base station;

c) using said operations center to cause said RF base station transceiver to transmit a plurality of polling messages simultaneously to all of said authorized mobile platforms which are not then communicating with said base station, each said polling message being addressed to a specific one of said mobile platforms and designating a dedicated return channel for its associated mobile platform to respond on;

d) waiting a predetermined period of time for a response from each of said authorized mobile platforms not then communicating with said RF base station transceiver; and

e) causing at least one of said mobile platforms to generate a response on its associated dedicated return channel to establish a communications link with said RF base station transceiver.

15. The method of claim 14, further comprising the step of causing each of said polling messages to timeout substantially simultaneously if a response on its associated said dedicated return channel is not received within a predetermined time period.

16. The method of claim 14, further comprising the step of causing said operations center to maintain a database of unused return channels at any given time which may be assigned as preliminary return channels with subsequently transmitted polling signals.

17. A system for establishing a plurality of radio frequency (RF) communications links between an RF base station transceiver and a plurality of mobile platforms each carrying an RF transceiver, wherein said mobile platforms are all traveling within a predetermined coverage region, the system comprising:

an RF base station transceiver disposed within said coverage region;

a network operations center (NOC) for maintaining a database of available return communication channels and a database of mobile platforms authorized to establish communication links with said RF base station transceiver;

a satellite-based transponder disposed in orbit over said predetermined coverage region;

said NOC operating to cause said RF base station transceiver to transmit a plurality of multicast polling messages, via said satellite-based transponder, each addressed to a specific one of said mobile platforms, each said polling message designating a dedicated return channel on which its associated said mobile platform is to communicate with said RF base station transceiver; and

wherein said polling messages that are not responded to by their associated said mobile platforms timeout within a given time period after being transmitted from said RF base station transceiver.

18. The system of claim 17, wherein said dedicated return channels associated with said polling signals that timeout are re-entered into said database of said NOC.